VOL.1
NO.11

STATUS 1500

DECEMBER
1983

* 12 issues £10.50 (UK) * overseas £14.50 * published monthly *

* Edited by RONALD COHEN, 62 BLENHEIM CRESCENT, LONDON W.11 *

THE PAST YEAR

For me 1983 has been a very happy year. Editing this newsletter has at times been a hair-raising effort; but it has always been great fun. I have learnt so much about the PC 1500. I have even learnt - most of the tine - to keep my temper. Most importantly, I have made so many good friends, even though most of them are only known through correspondence - occasionally as voices on the telephone. I am always amused by readers who presume that all other readers have the same knowledge and interests as themselves. In fact subscribers are drawn from an incredibly wide variety of professions and backgrounds. Army, navy, airforce, the church, the law; pilots in the air and divers under the sea; professors and schoolboys; doctors, scientists, managers and engineers; sales,architecture, insurance, surveying,banking and oil all make their contribution to a subscription list which at the last count extended to 23 countries. Xmas is the season of goodwill to all, and it would be mean and petty to exclude even those who tear their newsletter up into little pieces and post them to me, ask questions which have already been answered, haggle over the sum of their subscriptions, send in programs which have not been debugged, or change their address with bewildering frequency. It is possible even to feel benevolent towards those who disagree with me on technical points, or whose sense of humour is not quite identical with my own. Nor must I forget all those whose contribution has been less active - the silent majority - who tend to be merely names on a list, a label on an envelope. Gauging your unspoken reactions has been not the least part of the fun.To each of you, known and unknown,wherever you may be, let me take this opportunity to wish you

A VERY HAPPY XMAS AND NEW YEAR!

```
5:TEXT :LF 14:
  GRAPH
7:FOR B=0TO 180
  STEP 50
10:X=0:Y=180:Z=20
  0
20:FOR F=0TO 90
  STEP 10
30:X=X+10:Y=Y-10:
  Z=Z-10
40:LINE (X,B)-(10
  0,Y+B)-(Z,B),9
  *(X<B/2),2
50:NEXT F
60:NEXT B
99:COLOR 3
100:X=85,Y=0
110:FOR F=0TO 8
115:G=SGN (3.1-F)
120:GLCURSOR (X,Y)
130:LPRINT "*"
140:X=X+22:Y=Y+36*
  G
150:NEXT F
160:GLCURSOR (0,0)
200:FOR F=1TO 25
210:Y=RND 120:X=
  RND (200-Y)+Y/
  2
215:CSIZE RND 3
220:COLOR RND 3
230:GLCURSOR (X,Y)
  :ROTATE RND 4-
  1
235:LPRINT CHR$ (3
  2+RND 90)
240:NEXT F
250:FOR F=90TO 110
260:LINE (F,0)-(F,
  -40),RND 9,0
270:NEXT F
300:P=40:Q=-40:R=1
  60:S=-120
320:FOR F=10TO 40
  STEP 10
330:LINE (P,Q)-(R,
  S),RND 5,RND 3
  ,0
340:P=P+10:Q=Q-10:
  R=R-10:S=S+10
350:NEXT F
355:ROTATE 0
360:CSIZE 1:
  GLCURSOR (7),-
  80)
365:FOR D=1TO 11:
  READ E:LPRINT
  CHR$ E;:NEXT D
370:GLCURSOR (0,-5
  00):END
400:DATA 109,101,1
  14,114,121,32,
  88,109,97,115,
  33
```

IAN TRAYNOR has discovered the use of SHIFT/CLEAR. If you BREAK during the running of a program, turn to PRO mode, and then press either of the vertical cursor keys, you return normally to the line in which the BREAK occurred; in order to get the first or last line you have had to LIST them by line number. However, if you press SHIFT and then CLEAR, the use of these cursors reverts to normal.

This is useful information. I had always wondered about the meaning of the letters CA above the CLEAR key. Thanks.

L.E.SIMONS has difficulty with page 130 of the Technical Reference Manual. DB corresponds to no listed mnemonic. And there is no listed op-code for &FA.

DB could possibly be an abbreviation for "Double-Byte" - i.e. 2 bytes of data. &FA has me completely foxed. Nor can I make any sense of the subsequent comment:

> Returns to the address that data plus one is added to the "data written address" after storing the error code is stored in UH.

You could try writing to SHARP (UK) in Manchester, but are not likely to get a useful reply.

JAMES LOTHIAN suggests that it is possible to increase the available memory of the unexpanded PC 1500 by keying POKE 30821, 64,0 and then NEW, at the expense of the RESERVE area, giving an extra 197 bytes of program.

Of course this would also wipe out the 7 bytes of ROM information at the beginning of the Reserve area; though I have not yet discovered the real reason for the necessity for these. But surely you also need to POKE 30823, 64,0 and the same for 30825.

FRANK ODDS tells me I am wrong in my reply to CHRISTOPHER LEDSAM last month. There *DOES* exist a book which deals with Assembly Language in general, without reference to a specific chip. It is:

"MICROPROCESSORS & MICROCOMPUTERS - Their Use and Programming"
by Eric Huggins, Macmillan, paperback, £4.95.(1979)

I now have this book, and find it as helpful as you describe. Only part of the book deals with Assembly Language, for a "Typical Computer". The rest relates language to microprocessor. It is not an easy subject, and needs intensive study; but the book is as clearly written as is humanly possible. Highly recommended to anyone who will take the time to study it.

DAVID RIHOY hopes to convert me to his dislike of Hex, wonders why our programs do not make greater use of Labels (other than DEF labels). He points out that the renumbering of GOTOs and GOSUBs will no longer present a problem. Even if the GOTO is directed to an expression, GOTO STR$ (*expression*) would still find the Label. I.e., instead of

```
10: GOTO ASC INKEY$
          then if INKEY$ is A
65: line arrived at by GOTO.
```

you could have:

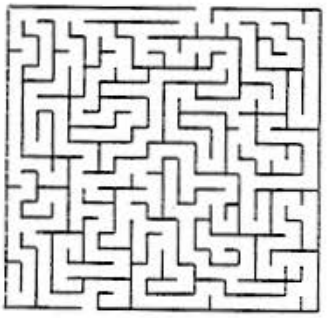
```
10: GOTO STR$(ASC INKEY$)
```

and 65: "65"(line arrived at by GOTO)

and this would not be affected by renumbering line 65.The label would still be found.

You are right about labels: although I prefer to keep the same line number as the label, for sake of readability. As far as Hex is concerned, I do not like it either, but regard this as a fault in myself to be corrected by effort. The chart on page 61, for instance, would become absolute nonsense in decimal.

"AMAZE" draws an infinite series of mazes, a new one each time.
"THE VISITOR" - no comment.
"TEASER" is a dot-changing problem: it explains itself when run.



```
 10 REM AMAZE ... Chris North 1983
 20 GOTO 400
 30 REM next cell
 40 M(I,J)=M(I,J)-1:J=J+1:M(I,J)=4:Q=0:RETURN
 50 J=J-1:M(I,J)=3:Q=0:RETURN
 60 M(I,J)=M(I,J)-2:I=I+1:M(I,J)=4:Q=0:RETURN
 70 I=I-1:M(I,J)=2:Q=0:RETURN
100 REM main loop
110 X=0:BEEP 1,1,1
120 IF M(I,J-1)<>0LET X=X+8
130 IF M(I-1,J)<>0LET X=X+4
140 IF M(I+1,J)<>0LET X=X+2
150 IF M(I,J+1)<>0LET X=X+1
160 GOSUB 200+X:GOTO 110
201 ON RND 3GOSUB 50,60,70:RETURN
202 ON RND 3GOSUB 40,50,70:RETURN
203 ON RND 2GOSUB 50,70:RETURN
204 ON RND 3GOSUB 40,50,60:RETURN
205 ON RND 2GOSUB 50,60:RETURN
206 ON RND 3GOSUB 40,50:RETURN
207 GOSUB 50:RETURN
208 ON RND 3GOSUB 40,60,70:RETURN
209 ON RND 2GOSUB 60,70:RETURN
210 ON RND 2GOSUB 40,70:RETURN
211 GOSUB 70:RETURN
212 ON RND 2GOSUB 40,60:RETURN
213 GOSUB 60:RETURN
214 GOSUB 40:RETURN
215 IF B<>WLET B=B+Q:GOTO 270
220 LINE (0,0)-(0,-HO),0,0
230 FOR J=1TO W:IF (M(A,J)=2)+(M(A,J)=4)LET T=J*WO:LINE (T,0)-(T,-HO),0,0
240 NEXT J:GLCURSOR (0,-HO):SORGN :IF A=HGOTO 300
250 FOR J=1TO W:IF M(A,J)>2LET T=J*WO:LINE (T-WO,0)-(T,0),0,0
260 NEXT J:B=1:A=A+1
270 I=A:J=B:Q=1:RETURN
300 REM finish
310 X=RND (W-2)+1:LINE (0,0)-(WO*(X-1),0):LINE (WO*X,0)-(WO*W,0):TEXT :LF 6:END
400 REM initialise
410 CLEAR :RANDOM :H=20:W=20:HO=205/H:WO=205/W:DIM M(H+1,W+1):TEXT :GRAPH :SORGN
420 FOR I=0TO W+1:M(0,I)=1:M(H+1,I)=1:BEEP 1,1,1:NEXT I
430 FOR I=0TO H+1:M(I,0)=1:M(I,W+1)=1:BEEP 1,1,1:NEXT I
440 X=RND (W-2)+1:LINE (0,0)-(WO*(X-1),0):LINE (WO*X,0)-(WO*W,0)
450 I=1:J=1:A=1:B=1:Q=0:M(I,J)=4:GOTO 100
```

```
 10 REM The Visitor ... Chris North 1983
 20 CLEAR :A=5:B=4:C=8:DIM A$(A,1)*80,B(B),D(B),C$(C)*80:CLS :WAIT 0:PRINT "       The Visitor
 30 FOR N=0TO 1:FOR M=0TO A:READ A$(M,N):BEEP 1,1,1:NEXT M:NEXT N
 40 FOR N=1TO 13:READ X:FOR M=0TO C-1:X=INT (X/2):Y=INT (X/16):Z=X-Y*16:BEEP 1,1,1
 50 X$=STR$ Y+MID$ ("01234567B9ABCDEF",Z+1,1):C$(7-M)=X$+C$(7-M)+X$:NEXT M:NEXT N:READ C$(C)
 60 FOR N=0TO B:READ B(N),D(N):BEEP 1,1,1:NEXT N:BEEP 1
 70 CLS :GCURSOR B9:FOR N=0TO 66:GPRINT 127;:BEEP 1,1,1:NEXT N:GCURSOR 83
 80 FOR N=1TO 10:READ X:V=&FC00+5*X:FOR L=0TO 4:GPRINT 127-PEEK (V+L);:NEXT L:GPRINT 127;:NEXT N
 90 GOSUB 180:PAUSE :WAIT 15:FOR N=0TO C-1:GCURSOR 0:GPRINT C$(N):NEXT N:GOSUB 180
100 WAIT 20:GCURSOR 23:GPRINT C$(C):WAIT 0:P=25:PAUSE
110 FOR N=1TO A:P=P+1:GCURSOR P:GPRINT A$(N,0):NEXT N:IF P<80GOTO 110
120 P=82:GCURSOR P:GPRINT "0000";A$(0):PAUSE
130 FOR N=1TO A:P=P-1:GCURSOR P:GPRINT A$(N,1);:IF P<79GPRINT "1E1E00";
140 NEXT N:IF P>27GOTO 130
150 GCURSOR 27:GPRINT "00000000000000000000000000000000"
160 WAIT 20:GCURSOR 0:GPRINT C$(C-1)
170 GOSUB 180:WAIT 15:FOR N=C-1TO 0STEP -1:GCURSOR 0:GPRINT C$(N):NEXT N:GOSUB 180:PAUSE :END
180 PAUSE :FOR N=0TO B:BEEP 1,B(N),D(N):NEXT N:RETURN
200 DATA "037F43"
210 DATA "000000037F533020"
220 DATA "000000633F131018"
230 DATA "003010131F131018"
240 DATA "003010131F133020"
250 DATA "000030137F430000"
260 DATA "437F0300"
270 DATA "2030537F03000000"
280 DATA "1B10133F63000000"
290 DATA "1B10131F13103000"
300 DATA "2030131F13103000"
310 DATA "0000437F13300000"
320 DATA &7E,&7C,&7C,&78,&78,&FB,&F8,&78,&78,&70,&70,&60,&40
330 DATA "3F2121000000000000000000"
340 DATA 135,250,120,250,155,200,255,140,180,250
350 DATA 77,97,99,68,111,110,97,108,100,115
```

```
100 REM TEASER ... Chris North 1983
110 GOTO "A"
120 REM get input
130 CALL &E243:A$=INKEY$ :RETURN
150 REM main prog.
160 GOSUB 370:WAIT 0:CURSOR 4:PRINT "Change... ROW          ";
170 CURSOR 18:PRINT "?":GOSUB 130:CURSOR 18:PRINT A$;:M=VAL A$
180 CURSOR 21:PRINT "COL ?":GOSUB 130:CURSOR 25:PRINT A$;:N=VAL A$
190 IF (M<1)+(M>3)+(N<1)+(N>3)GOSUB 350:GOTO 160
200 IF A(M,N)<0GOSUB 340:GOTO 160
210 A(M,N)=-1:K=K+1:GCURSOR 0:GPRINT T1(1);"FFFFFF";T1(2);"FFFFFF";T1(3):GOTO STR$ (M*10+N)
220 REM reversals
230 "11":A(1,2)=-A(1,2):A(2,1)=-A(2,1):A(2,2)=-A(2,2):GOTO 160
240 "12":A(1,1)=-A(1,1):A(1,3)=-A(1,3):GOTO 160
250 "13":A(1,2)=-A(1,2):A(2,3)=-A(2,3):A(2,2)=-A(2,2):GOTO 160
260 "21":A(1,1)=-A(1,1):A(3,1)=-A(3,1):GOTO 160
270 "22":A(1,2)=-A(1,2):A(2,1)=-A(2,1):A(2,3)=-A(2,3)
280 A(3,2)=-A(3,2):GOTO 160
290 "23":A(1,3)=-A(1,3):A(3,3)=-A(3,3):GOTO 160
300 "31":A(2,1)=-A(2,1):A(3,2)=-A(3,2):A(2,2)=-A(2,2):GOTO 160
310 "32":A(3,1)=-A(3,1):A(3,3)=-A(3,3):GOTO 160
320 "33":A(2,3)=-A(2,3):A(3,2)=-A(3,2):A(2,2)=-A(2,2):GOTO 160
330 REM errors
340 CLS :BEEP 2:PAUSE "Change dot to blank only":CLS :RETURN
350 CLS :BEEP 2:PAUSE "Give proper positions 1-3":CLS :RETURN
360 REM check for solution or failure
370 T=0:FOR M=1TO 3:FOR N=1TO 3:T=T+A(M,N):NEXT N:NEXT M
380 IF (T=7)*(A(2,2)=-1)CLS :GOSUB 420:BEEP 2:CURSOR 3:WAIT 200:PRINT "Got it in";K;" goes":BEEP 2:GOTO 600
390 IF T=-9CLS :BEEP 2:WAIT 200:PAUSE "Hard luck!":PRINT "You cant solve it now":BEEP 2:GOTO 600
410 REM display matrix
420 FOR N=1TO 3:T(N)=0:T1(N)=127:FOR M=1TO 3:IF A(M,N)LET T(N)=T(N)+A(M,0):T1(N)=127-T(N)
430 NEXT M:NEXT N:GCURSOR 0:GPRINT T(1);0;0;0;T(2);0;0;0;T(3):RETURN
440 REM initialise
450 "A"CLEAR :RANDOM :WAIT 0:DIM A(3,3),T(3),T1(3)
455 FOR M=1TO 3:A(M,0)=2^(3*M-3):FOR N=1TO 3:A(M,N)=2*RND 2-3:NEXT N:NEXT M
460 CURSOR C:PRINT "Instructions ?":GOSUB 130:IF A$="N"CLS :GOTO 160
470 IF A$<>"Y"BEEP 2:GOTO 460
480 WAIT :PRINT "Press ENTER to step thru"
490 PRINT "Solve a 3x3 matrix":PRINT " of random dots & blanks"
500 WAIT 0:GPRINT "4900000048000000049":CURSOR 3:WAIT :PRINT "Looking like this"
510 PRINT "so that dots appear in all":PRINT " positions except centre"
515 WAIT 0:GPRINT "4900000041000000049":CURSOR 3:WAIT :PRINT "Like this"
520 PRINT "Position referred to ":PRINT " by row & column ...":PRINT " e.g. top right = 1 3"
530 PRINT "You change dot to blank":PRINT "  NOT blank to dot"
540 PRINT "When a dot is blanked":PRINT " its neighbours reverse"
550 PRINT " i.e. dot to blank":PRINT " and blank to dot":PRINT "Changing a corner"
560 PRINT " changes 3 neighbours":PRINT "Changing middle side":PRINT " changes 2 corners"
570 PRINT "Changing centre":PRINT " changes 4 middle sides"
580 PRINT "Try it & see what happens!"
590 WAIT 0:PRINT "Repeat ";:C=7:GOTO 460
600 WAIT 0:PRINT "Another go ?":GOSUB 130:IF A$="Y"CLS :GOTO 110
610 IF A$<>"N"BEEP 2:GOTO 600
620 END
```

AN INTERESTING ERROR

Line 210 of ANYBASE CONVERSION *by GEORGE COOK (page 98)* should be changed to:

210: IF PEEK 40960<>192 GOTO 300

Firstly let me say that the mistake is not the fault of the author, but of the editor, who was unable to resist the temptation to elaborate what was originally a perfectly viable program. In any case, there *may* not be an error in the line, depending on where you were when you keyed it in! If the PC 1500 was attached to the CE 150 at the time of keying in, and subsequently you detached it, the program runs OK: the error produced by having no printer is coped with by the *ON ERROR GOTO* statement. But if you keyed in the program when computer was not connected to printer, you will have produced a *syntax* error, which is not coped with. A 'graphic' instruction which is keyed in when writing a program, if the computer is *not* connected to the printer, does not appear as a 2-byte 'Reserved Word', but as separate letters, thus giving *ERROR 1* , as here.

QUIZ - HOW WELL DO YOU KNOW YOUR COMPUTER?

QUESTIONS	*ANSWERS*
1) So what *DOES* it say on the back of your PC 1500?	*Look and see.*
2) What are the locations of the SYSTEM POINTERS?	*page 33.*
4) And how do you wind back into the computer paper unlimited?	*page 24*
5) Does it make any difference whether you start executing a program by RUN, DEF, or GOTO?	*page 135 of SHARP's Instruction Manual*
6) How do you draw a circle?	*page 14 (this newsletter)*
7) What is STATUS 5?	*page 3*
8) When you key TIME, what is displayed on the left - month/year/day/hour?	*try it and see.*
9) The 2-byte codes for Reserved Words all start with 230 or 240 or 241, with one exception. What is it?	*page 28*
10) Your 1st byte of program is	*your computer will tell you.*
11) How many bytes of Reserve are available?	*page 3 of SHARP's Instruction Manual.*
12) And of Reserve Template Area?	*[as above]*
13) Do you know the ASCII code for A ?	*10: WAIT 0: A$=INKEYS: PRINT ASC A$: GOTO 10*
14) And for the 6 "software keys"?	*[as above]*
15) And the cursor keys - up, down, left, right?	
16) (A=1)=0 What does this mean?	*page 68*
17) What are ERROR 4, ERROR 44, ERROR 6, ERROR 80, ERROR 11 ?	*SHARP's Instruction Manual, page 145*
18) Will the following line give SYNTAX ERROR? *10: A=12..34..56.*	*try it.*
19) ON (expression) GOTO // ON ERROR GOTO // ON (expression) GOSUB // ON ERROR GOSUB. 3 of these 4 statements are legal. 1 is not. Which?	*Instruction Manual page 83 or try it and see.*
20) What is the maximum possible character size?	*page 42 of this newsletter.*

IF YOU SCORE 100% on this quiz you know your computer better than I do!

HANGMAN

The traditional game of guessing a word, a letter at a time, before the executioner triumphs. A vocabulary of 350 words is possible with 8K, or about 100 with 4K. Fill in lines 5002 to 5349 with your own words. If less than 350 words, , 350 in line 65 must be altered accordingly.

```
  1:TEXT
  2:LF 12:CLEAR
 49:ON ERROR GOTO
    60
 50:DIM A$(16):DIM
    B$(16)
 60:RANDOM
 65:GOSUB (5000+
    RND 350)
 70:Z=3-(LEN W$)10
    )
130:CSIZE Z
131:ZZ=3-Z
139:LF -6
140:COLOR 3:LPRINT
    LEN W$
141:LF 5:GRAPH :
    CSIZE Z
142:GLCURSOR (17-4
    *ZZ,-15+ZZ):
    FOR F=1TO LEN
    W$:LPRINT "-";
143:NEXT F
150:FOR N=1TO LEN
    W$
160:A$(N)=MID$ (W$
    ,N,1)
180:B$(N)=" "
200:NEXT N
300:BEEP 2+3*K,30,
    91
304:GLCURSOR (0,-3
    0)
305:INPUT "LETTER.
    .";I$
306:GLCURSOR (0,0)
310:K=1
320:FOR N=1TO LEN
    W$
340:IF I$=A$(N)
    GOSUB 1000:R=R
    +1:K=0:B$(N)=I
    $:A$(N)="*":
    GOTO 390
390:IF R=LEN W$
    GOTO 4000
400:NEXT N
410:C=C+K
420:IF K>0GOSUB (2
    000+100*C)
430:IF C=7GOTO 300
    0
450:GOTO 300
 1000:GLCURSOR (0,
      0):TEXT
 1005:COLOR 2
 1015:CSIZE Z
 1020:LCURSOR N
 1030:LPRINT I$
 1035:LF -1
 1040:GRAPH
 1045:COLOR 1
 1050:RETURN
 2100:LINE (0,-10)
      -(215,30),0,
      1+2*(C=0),B
 2105:GLCURSOR (0,
      0)
 2110:RETURN
 2200:LINE (10,30)
      -(30,70)
 2210:LINE (15,30)
      -(30,60)
 2220:LINE (40,60)
      -(60,30)
 2230:LINE (40,70)
      -(70,30)
 2240:RETURN
 2300:LINE (30,30)
      -(40,190),0,
      1,B
 2310:RETURN
 2400:LINE (40,150
      )-(60,180)-(
      70,180)-(40,
      140)
 2410:RETURN
 2500:LINE (40,180
      )-(140,190),
      0,1,B
 2510:RETURN
 2600:LINE (133,18
      0)-(133,140)
 2620:GLCURSOR (12
      3,118)
 2630:O$="O"
 2640:CSIZE 4
 2650:LPRINT O$
 2660:CSIZE 3
 2670:RETURN
 2700:COLOR 3
 2705:BEEP 2,180,2
      00
 2706:BEEP 1,240,2
      00
 2710:S$="*"
 2720:T$="("
 2730:CSIZE 1
 2735:FOR F=1TO 3
 2740:LINE (125,13
      2)-(127,134)
      ,1,3,B
 2750:LINE (135,13
      2)-(137,134)
      ,1,3,B
 2760:LINE (130,13
      1)-(130,127)
 2765:NEXT F
 2770:ROTATE 1:
      GLCURSOR (12
      8,124):
      LPRINT T$
 2780:ROTATE 0
 2790:COLOR 1
 2800:LINE (124,11
      8)-(124,60)-
      (114,60)
 2810:LINE (136,11
      8)-(136,60)-
      (146,60)
 2820:LINE (124,75
      )-(136,75)
 2830:LINE (124,11
      0)-(110,110)
 2840:LINE (136,11
      0)-(150,110)
 2850:GLCURSOR (11
      0,107)
 2852:LPRINT S$
 2860:GLCURSOR (15
      0,107)
 2862:LPRINT S$
 2870:CSIZE Z
 2880:RETURN
 5000:GLCURSOR (0,
      2)
 3005:COLOR 3
 3010:TEXT
 3015:CSIZE Z
 3020:FOR N=1TO
      LEN W$
 3030:IF B$(N)=" "
      LCURSOR N:
      LPRINT A$(N)
      :LF -1
 3040:NEXT N
 3060:GOTO 1
 4000:FOR F=1TO (7
      -C)
 4010:BEEP 1,240/F
      ,50*F
 4040:BEEP F,120/F
      ,150*F
 4050:NEXT F
 4060:LINE (5,-5)-
      (210,25),2,3
      ,B
 4065:IF C=0GOSUB
      2100
 4080:GOTO 1
 5001:W$="DIFFICUL
      T":RETURN
 5002 TO 5349:W$="
      ?...?":
      RETURN
 5350:W$="IMPOSSIB
      LE":RETURN
```

```
STATUS 1
                1548
```

"PASS THE PC"

by Frank Odds

[rules on next page]

```
 10:RANDOM
 20:Z=STATUS 3-148
    :A=Z+27:Y=INT
    (Z/256):Z=Z-25
    6*Y
 30:W=STATUS 3-904
    :U=INT (W/256)
    :W=W-256*U
 40:GOSUB 1930
 50:B=STATUS 2-667
 60:FOR L=1TO 22
 70:POKE B,141:B=B
    -22
 80:RESTORE
 90:FOR K=1TO 4
100:READ N$
110:FOR J=1TO 11
    STEP 5
120:C=ASC (MID$ (N
    $,J,1)):GOSUB
    195
125:D=16*C:C=ASC (
    MID$ (N$,J+1,1
    )):GOSUB 195
130:D=D+C:GOSUB 19
    0
135:C=ASC (MID$ (N
    $,J+2,1)):
    GOSUB 195
140:D=C:GOSUB 190
145:C=ASC (MID$ (N
    $,J+3,1)):
    GOSUB 195
150:D=16*C:C=ASC (
    MID$ (N$,J+4,1
    )):GOSUB 195
155:D=D+C:GOSUB 19
    0
160:NEXT J
170:NEXT K
180:NEXT L
185:DIM M$(10)*12:
    END
190:POKE A,D:A=A-1
    :RETURN
195:C=C-48:IF C>9
    LET C=C-7
196:RETURN
200:"A"T=TIME :
    INPUT "HOW MAN
    Y PLAYERS? ";X
210:WAIT 0:POKE &7
    788,RND 150:
    PRINT "PASS ME
     ROUND"
220:CALL &7750
230:U=500*(TIME -T
    ):CLS
240:BEEP 5:WAIT 20
    0:PRINT "GET R
    EADY..."
250:M=RND 4
260:GOTO 300+100*M
400:WAIT 120:PRINT
    "Memorize thre
    e numbers"
410:L=5:U=100-U:IF
    U<50LET U=50
430:WAIT U:M=RND (
    10^L):J$=STR$
    M:BEEP 2:PRINT
    M
440:INPUT "What wa
    s it? ";K$
450:IF K$=J$PAUSE
    "RIGHT!":L=L+1
    :IF L<8LET U=U
    -10:GOTO 430
460:IF L=8GOTO 800
470:PAUSE "WRONG!
    IT WAS";M:GOTO
    850
500:U=INT (20-U):
    IF U<4LET U=4
510:WAIT 120:PRINT
    "You have ";U;
    " seconds..":
    PRINT "to do a
     sum!":BEEP 2
520:P=RND 20:Q=RND
    10:R=RND 15
530:WAIT 0:M=TIME
    :GOTO (530+10*
    RND 3)
540:S=P+Q-R:IF S=0
    GOTO 520
545:PRINT STR$ P+"
    +"+STR$ Q+"-"+
    STR$ R;:GOTO 5
    70
550:S=P*P:IF S=0
    GOTO 520
555:PRINT STR$ P+"
    squared";:GOTO
    570
560:S=P*Q:IF S=0
    GOTO 520
565:PRINT STR$ P;:
    GPRINT "221408
    1422";:PRINT
    STR$ Q;
570:PRINT "=?";:J$
    =STR$ S
575:K$=INKEY$ :IF
    K$=""IF (TIME
    -M)*1E4<UGOTO
    575
580:IF K$=""PAUSE
    "TIME UP..":
    GOTO 595
590:PRINT K$;:
    INPUT L$:IF L$
    <>""LET K$=K$+
    L$
591:IF K$=J$CLS :
    GOTO 800
592:PAUSE "WRONG!"
595:PAUSE "IT WAS
    ";S:GOTO 850
600:WAIT 120:PRINT
    "TYPING TEST"
610:PRINT "Type th
    e letter that.
    .":PRINT "appe
    ars on the scr
    een..":PRINT "
    FAST!!"
620:WAIT 30:R=3
630:P=RND 90:IF P<
    65GOTO 630
640:CLS :GCURSOR
    RND 149:BEEP 2
    :PRINT CHR$ P:
    Q=TIME
650:K$=INKEY$ :IF
    K$=""IF (TIME
    -Q)*1E4<RGOTO
    650
660:IF K$=""PAUSE
    "TOO SLOW!":
    GOTO 850
665:IF ASC K$<>P
    PRINT "WRONG!"
    :GOTO 850
670:R=R-.25:IF R>1
    .9GOTO 630
680:GOTO 800
700:WAIT 120:PRINT
    "Watch closely
    ..."
710:U=INT (120-U):
    K$=""
715:Q=0:P=RND 8
720:FOR J=1TO 10
725:F=RND 8
730:M$(J)=B$(F)
735:IF F=PLET Q=Q+
    1
740:NEXT J
750:J$=STR$ Q:WAIT
    U:CLS
760:GCURSOR RND 94
    :FOR J=1TO 9:
    GPRINT M$(J);:
    NEXT J
770:WAIT 120:
    GPRINT M$(10)
780:CLS :WAIT 0:
    PRINT "HOW MAN
    Y ";:GPRINT B$
    (P);
790:INPUT K$
795:CLS :IF K$<>J$
    PAUSE "WRONG!
    THRE WERE";Q:
    GOTO 850
800:PAUSE "WELL DO
    NE!"
810:GOTO 210
850:CALL &7790:CLS
    :CURSOR 11:
    PRINT "OUT!!"
860:FOR J=1TO 20:
    CALL &77A2:FOR
    K=1TO 5:NEXT K
    :NEXT J
870:X=X-1:IF X<1
    GOTO 900
880:GOTO 210
900:BEEP 5:WAIT 12
    0:PRINT "GAME
    OVER!!":END
1000:REM "D314DBF
     45140150","0
     0267FF143C41
     51","CA251C4
     151C4151","C
     A251C4151C41
     51"
1010:REM "C4151A1
     15CA115C","C
     41515E1515E1
     51","C4151C4
     151D314D","D
     314DD314DD31
     4D"
1020:REM "4015C00
     267FF143","C
     4151CA251C41
     51","C4151CA
     251C4151","C
     4151073437A2
     5C"
1030:REM "FF143FF
     1435E151","5
     E151C4151C41
     51","D314DD3
     14DD314D","D
     314DD314DBF4
     51"
1040:REM "D0133A5
     13A7253A","6
     0233BC229EC1
     47","B513A60
     233B513A","C
     2A67A115CD31
     4D"
1050:REM "7253A60
     2339322D","C
     41518A143302
     3A","8A143C0
     62DBC229","3
     023AD0133A51
     3A"
1060:REM "BC229EC
     147B513A","6
     0233B513A2A5
     47","6023330
     23AD0133","A
     513AD0133A51
     3A"
1070:REM "8A14330
     23A8A143","C
     062DBC229302
     3A","D0133A5
     13AD0133","A
     513A7253A602
     33"
1080:REM "6023312
     729EB225","3
     023AD0133A51
     3A","D0133A5
     13A7253A","6
     02339322DC41
     51"
1090:REM "C4151A2
     547FF143","3
     023A60233FF1
     43","4233AEC
     1473023A","6
     0233BC229602
     33"
1100:REM "FF14330
     23A60233","9
     322DBC229BC2
     29","D832D93
     22D9322D","3
     02333023AEC1
     47"
1110:REM "D0133A5
     13AD0133","A
     513A7253A602
     33","BC229EC
     147B513A","6
     0233B513AB42
     51"
1120:REM "D0133A5
     13A7253A","6
     02339322DC41
     51","8A14330
     23A8A143","C
     062DBC229302
     3A"
1130:REM "3023AFF
     143D314D","F
     F1433023AA91
     36","8132F12
     829EB225","3
     023AD0133A51
     3A"
1140:REM "A913681
     32FD624D","C
     4151D314D6A1
     43","3033A6A
     143B2136","A
     013A6A143D31
     4D"
1150:REM "6A14330
     33A6A143","B
     2136A013A6A1
     43","D314D38
     23AFF143","D
     314DFF143302
     3A"
1160:REM "7513AFF
     1438122F","A
     91365533AFF1
     43","5123695
     13A09343","D
     624DC4151D31
     4D"
1170:REM "FF14330
     23AA9136","8
     132FA632FBC2
     29","EB22505
     32229225","2
     02297122F831
     36"
1180:REM "C4151D3
     14D6A143","3
     033A6A143B21
     36","A013A6A
     143D314D","3
     023AFF143D31
     4D"
```

[continued.....

```
1190:REM "9213EB0
     1365033E","B
     015276160B01
     57","5914D65
     1479213E","E
     024790162D62
     4D"
1200:REM "B015725
     262B0157","E
     C1478513E991
     36","B0133E0
     3360314D","9
     0162D314D601
     47"
1210:REM "0000000
     00000000","0
     000000000000
     00","0000000
     00000000","E
     C247D314D192
     3E"
```

```
1930:POKE &7750,&
     A5,&77,&86,&
     18,&A5,&77,&
     87,&1A,&55,&
     2A,&55,&08,&
     55,&0A,&A5,&
     77
1940:POKE &7760,&
     89,&DD,&87,&
     FF,&89,&06,&
     58,U,&5A,W,&
     B5,&00,&AE,&
     77,&89,&94
1950:POKE &7770,&
     AE,&77,&86,&
     14,&AE,&77,&
     87,&BE,&E6,&
     6F,&A5,&77,&
     88,&DF,&AE,&
     77
1960:POKE &7780,&
     88,&87,&00,&
     99,&35,&9A,U
     ,W,255,0
1970:POKE &7790,&
     48,&01,&4A,&
     FF,&6A,&05,&
     8E,&E6,&6F,&
     4A,&02,&BE,&
     E6,&6F,&60,&
     99
```

"PASS THE PC" - A GAME FOR CHRISTMAS

This is a PC 1500 version of "pass the parcel". Once the program has been initiated (by the RUN command) the computer is ready to play. There is no limit to the number of players. Press DEF A and the music starts. Pass the PC from person to person. Whoever is holding it when the music stops will be confronted with one of four tests of memory, reaction times or both. If they fail the test, they're out! The winner is the player who is still 'in' at the end. Beware; the tests get faster as the game goes on.

Instructions, hints and warnings

The game was developed on a machine with an 8k memory expansion. It cannot be run on an unexpanded PC 1500, but it can be run with 4k extra memory as described below. Lines 10-196 and 1000-2010 are involved in setting up machine code routines to provide the melodies. The remaining lines are concerned with the actual game-playing and are written in basic.

It is essential that the program should be CSAVEd as soon as it is written and before it is run. Check particularly the accuracy of lines 1930-1990 - any errors here are sure to lead to a crash! Once the initiation program is started (it takes about 1-2 min to run) it alters the program.

The author of the program will accept no responsibility for PC 1500s that are dented or otherwise damaged by overexcited PC passers!

To run the game with 4k memory expansion

The game has to be set up in two sections, CSAVEd then CLOADed. For the first section, copy lines 10-196 plus lines 1000 to 2010. CSAVE "PART 1" at this stage. Now copy lines 200-900 and CSAVE "PART 2". To operate the game, CLOAD "PART 1" and type RUN. The program will set up the machine code part. Now CLOAD the actual game-playing part (PART 2), which is started by DEF A as for the 8k version.

```
1980:POKE &77A0,&
     06,&9A,&68,&
     78,&6A,&4D,&
     FD,&62,&25,&
     BD,&FF,&2E,&
     88,&06,&6C,&
     77
1990:POKE &77B0,&
     93,&0E,&9A
2000:A$="186C5F2A
     1300":B$="10
     227D221000":
     C$="08142214
     0800":D$="00
     112A440800"
```

```
2010:E$="087B357B
     0800":F$="7F
     4149417F00":
     G$="0F0E7860
     3C00":H$="7F
     7F7F7F7F00":
     RETURN
```

STATUS 1

4295

"20 QUESTIONS" *by Mike O'Regan*

```
10:" "CLEAR :DIM
   Q$(0)*80,A$(0)
   *80:WAIT 100
20:PRINT "   ***
   20 QUESTIONS *
   **   "
30:X=RND (3)
40:PAUSE "The obj
   ect is ";
50:ON XGOTO 60,70
   ,80
60:PRINT "ANIMAL"
   :GOTO 85
70:PRINT "VEGETAB
   LE":GOTO 85
80:PRINT "MINERAL
   "
85:FOR K=1TO 20
90:INPUT "What is
    your question
   ?",Q$(0)
```

```
100:E$=RIGHT$ (Q$(
    0),1)
110:IF E$="E"OR E$
    ="L"OR E$="S"
    GOSUB "C":GOTO
    125
120:BEEP 1:PAUSE "
    NO"
125:NEXT K
126:PRINT "YOU HAV
    E HAD 20 QUEST
    IONS"
127:PRINT "As you
    were unable to
     ...":PRINT "g
    uess the objec
    t":PRINT "I RE
    FUSE TO TELL Y
    OU!"
128:GOTO 10
```

```
130:"C"IF LEFT$ (Q
    $(0),8)<>"IS I
    T A "THEN 150
135:IF K<3THEN 150
140:BEEP 5:PRINT "
    RIGHT you took
    ";K;" guesses"
    :WAIT 5
141:PRINT "I was t
    hinking of "
142:A$(0)=RIGHT$ (
    Q$(0),LEN Q$(0
    )-5)
143:FOR L=1TO LEN
    A$(0):PRINT
    MID$ (A$(0),L,
    1);:NEXT L:
    PRINT :GOTO 10
150:BEEP 2:PAUSE "
    YES"
160:RETURN
```

STATUS 1

642

Whether playing BLACKJACK in the Yukon, or circling the moon in an eccentric orbit, this pack of 9 games is quite amusing, even if not quite as amusing as it sets out to be. Some games are too hard, others are too easy. Nevertheless it is still good value, and good fun. Essentially American, both in terminology and facetiousness, only 2 games (SKETCH and TICTACTOE) need the printer - though of course you will still need the CE 150 in order to load the cassette.

TWISTER was the least interesting, a game of rearranging digits logically. BLACKJACK worked well, although I suspect the game is heavily CLOADED - sorry, loaded - in favour of the Bank. FOOTBALL of course is the American version: I did not stay with it long enough to find out what it was all about. It seemed quite clever: but the rules of American Football were not supplied. TASK FORCE is the equivalent of "BATTLESHIPS", played against the computer. Only 4 ships each: no visuals, and rather slow.

SOUNDOFF is more amusing than appears from its description. Each of the function keys produces a different sound. First, symbols appear on the screen above a series of keys, withthe appropriate sound for the key: then the player has to match them. Not as easy as it seems, but not impossible. A good test of perception.

HANGMAN is a quick game, for screen only. You may use the vocabulary of 45 words, or test an opponent with your own words. Since insetion of a letter already used does not produce a fault, I found it too easy. It is much less elaborate than my own HANGMAN game; less interesting, but snappier.

SKETCH could produce smoother results than my own SUPERSKETCH (p. 99), and works on a different principle. You can move the pen from point A to point B, blank: when satisfied, another key draws a straight line between the chosen points. You can also draw an arc, or - with difficulty - a circle.

MOON LANDING I found quite impossible. I never even acheived a Crash-Landing, let alone a decent one. Theoretically I am still in orbit, flying in ever-decreasing circles .....

TICTACTOE is American for NOUGHTS-AND-CROSSES. This was disappointing. The program has set responses: and an invariable first move. When the computer moved first, I drew every time: when I moved first, I inevitably won. Not a patch on the SIXPACK version of this game. I hope to borrow another PC 1500, and set the two programs playing against each other. We shall of course be the first (and only) publication to bring you our eyewitness reports of this incredibly exciting contest - perhaps the world's first NOUGHTS-AND-CROSSES OLYMPICS.

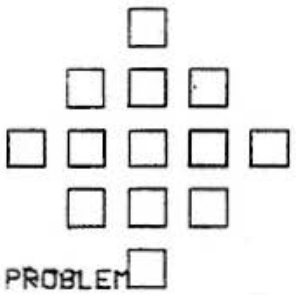
PC 2 'GAMES PACK' is available from TANDY Computer Centres at £6.95
All games fit into unexpanded machine.

STOP PRESS: There were angry scenes during the closing stages of the NOUGHTS & CROSSES POCKET COMPUTER OLYMPICS as hundreds of Mounted Police tried to prevent a solitary spectator from falling asleep. Finalists were TANDY (USA), SIXPACK (UK), and your EDITOR (human) . FINAL SCORES:

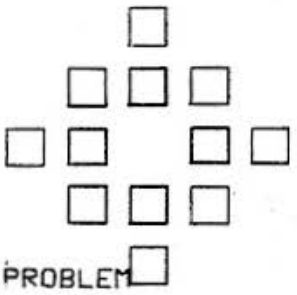
SIXPACK drew 3-3 against EDITOR, with 6 draws.
TANDY lost 1-5 against EDITOR, with 6 draws.
TANDY won 6-0 against SIXPACK, with 6 draws.

MINDBOGGLE CORNER

Wrong again! This program was meant to produce (in a variety of colors) the design on the left. Owing to my usual carelessness in keying it in, the design on the right appeared instead. Find my simple mistake, and win the usual magnificent prize. Closing date January 15th. Don't hurry - get it right this time! It is the first correct entry *opened* that wins, not the first entry received.




```
 1:TEXT :LPRINT "
   PROBLEM"
 5:GRAPH :
   GLCURSOR (0,10
   0):SORGN
10:X=0:Y=0:K=40:
   ON ERROR GOTO
   500
20:FOR F=1TO 15
30:LINE (X,Y)-(X+
   25,Y+25),0,RND
   4-1,B
40:READ A:READ B:
   X=X+A:Y=Y+B
50:NEXT F
100:DATA K,0,0,K,K
   ,0,0,K,0,-K,K,
   0,0,-K,K,0
110:DATA -K,0,0,-K
   ,-K,0,-K,0,K,0
   ,0,-K
500:GLCURSOR (0,-3
   00):END
```



MARKETPLACE ....TANDY's "TRS 80 News" for September contains a very useful alphabetical list of machinecode mnemonics - together with a numerical listing both in Hex and in Decimal. The accompanying article on their use is less impressive.....SIMON COX is preparing a booklet on how to get 96K ..... In Japan I hear that pens are available in a further 6 colours.[If any reader visits Japan, would he get me a couple of sets?].....KUMA have a list of software for PC 1500. The cassettes seem expensive, and requests for further information have met with no reply.....TANDY ask me to point out that the DMP 200 daisywheel printer mentioned in October is correctly known as the DWP 210 .....ATLANTIC NORTHEAST have an interesting range of program modules.

BINGO!

```
 1:INPUT "how man
   y cards? ";S
 5:DIM K(15),X(90
   )
10:FOR F=1TO S
12:J=1:GOSUB 500
15:GRAPH :ROTATE
   1:CSIZE 4
20:COLOR RND 4-1
25:LINE (0,0)-(21
   0,-350),,,B
30:LINE (70,0)-(7
   0,-350)
40:LINE (140,0)-(
   140,-350)
50:FOR V=1TO 4:
   LINE (0,-70*V)
   -(210,-70*V):
   NEXT V
60:FOR A=0TO 4
70:FOR B=2TO 0
   STEP -1
80:GLCURSOR (70*B
   +20,-70*A)
90:LPRINT K(J)
 95:J=J+1
100:NEXT B
110:NEXT A
120:TEXT :LF 12:
    BEEP 7
130:NEXT F
135:INPUT "calling
     speed(1-10) "
    ;T:T=(11-T)*10
140:CSIZE 2:USING
    "###":Z$=" *"
160:FOR Y=1TO 90:X
    (Y)=Y:NEXT Y
170:C=90
180:R=RND C
185:BEEP 1,RND 255
    ,50
190:WAIT 110-C+T:
    PRINT Z$;X(R);
    Z$
200:LF -1
210:LPRINT X(R);
220:LF 1
230:FOR F=R TO C-1
240:X(F)=X(F+1)
250:NEXT F
260:X(C)=0
270:C=C-1
280:IF C=0END
290:GOTO 180
500:FOR G=1TO 15
510:K(G)=RND 90
520:NEXT G
530:CC=0:BEEP 1,20
    ,50
540:FOR H=1TO 15
550:IF K(H)<K(H-1)
    LET D=K(H):K(H
    )=K(H-1):K(H-1
    )=D:CC=1
560:IF K(H)=K(H-1)
    LET K(H)=RND 9
    0:CC=1
570:NEXT H
580:IF CC=1GOTO 53
    0
590:RETURN

STATUS 1=735
```

GOLF - the rules

This fascinating game requires a keen eye, and steady nerve. RUN will design the hole you must play, with all the usual hazards. For a new hole, key DEF N. For another player to play the same hole, key DEF A. The stroke is played by pressing the number key for the club (keep your finger on it for half a second until you hear the BEEP). Details and Rules:-

YOU MUST USE THE APPROPRIATE CLUB FOR THE TYPE OF GROUND WHERE YOUR BALL LIES.

DRIVE OFF with 1 or 2 club. No. 1 is used also for PUTTING on the GREEN.
The FAIRWAY is GREEN: use no.3
WHITE is the ROUGH: use no.5
VERY ROUGH is hatched GREEN, use no.7
BLACK marks almost impenetrable WOODS or thickets: use no.8
BLUE is for PONDS AND STREAMS: see "HAZARDS" below.
RED is the color of BUNKERS and sandpits: no. 9 is required.

NOTE WELL that the club you use alters the distance the ball travels, by 5%, multiplied by the number of your club, of the distance you choose. Thus if you entered a force of "200" , with a no.3 club, you would lose 3 x 5% of 200, and your ball would have a travel of 170 yards only. 300 is maximum.

ANGLE of 0° is straight up the course. Enter angles to the right as plus; angles to left as minus. If you go off the paper, you are still on the course: play from the imaginary point where you are. (Use no.7)

The vertical LENGTH of each hole is marked beside the hole. The direction of the WIND appears on the screen, and as a flag at the top right-hand corner of the GREEN. The force of the WIND is considerable. It varies from second to second, and is shown on the screen after you have entered FORCE and ANGLE. The upper and lower limits of its force vary also. As the wind-force goes up and down, pick your moment to key the club you are using (Don't forget the delay) . 2nd player cannot profit by your mistakes: a new wind direction will be set for him by DEF A, after you finish playing the hole.

HANDICAPS range from 0 to 15. Your HANDICAP does not affect your score. It only affects the number of seconds (from 15 to 45) which you have available in which to play, thus limiting your opportunity to pick a suitable wind-force. Since every hole is new, PAR for each hole cannot be given: but the average is 4. Your editor has a handicap of 5, and has - very occasionally - gone round in 72. Novices are advised to start with HANDICAP 15.

HAZARDS and PENALTIES. - "FORCE" more than 300: excess is deducted from stroke.
Using the wrong club accidentally - PENALTY 2 strokes. (Opponents option: start again)
Using wrong club deliberately - barred for life!
WATER: you must 'lift' the ball, (play it out with no.1) to the bank furthest from the hole. PENALTY: 2 strokes.
BUNKERS: Built-in error of radius up to 10 from landing-point. (no.9)
WOODS: 1 chance in 3 of accurate shot: otherwise random distance or random angle.
Driving over woods: use no.2 instead of no.1. Otherwise 2 strokes penalty.
EXCEEDING TIME LIMIT: penalty 2 strokes, but carry on.
Decisions as to where a ball lies are entirely visual. In case of doubt or dispute the answer is simple: go by the wind, which is taken to blow it onwards or back the necessary fraction according to wind direction. Estimates of angle and distance must also be only visual. No rulers or protractors!

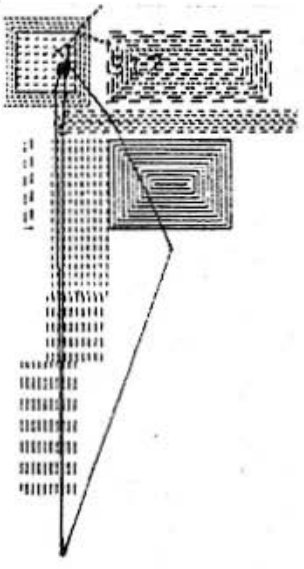
[It can very occasionally happen that a hole is too long for a 2nd player to return to the tee: in this case the hole must be abandoned.
About once in 20 holes]

"HOLE IN ONE!" - send it in! The first received will win a small prize.

[program overleaf ---

```
  1:"N"GRAPH :
    GLCURSOR (0,-T
    T-20):SORGN :
    GLCURSOR (0,-5
    00):SORGN
  2:CLEAR :U=64:
    RANDOM
  3:PP$="G":GOSUB
    1502
  5:GRAPH :RANDOM
 10:T=10+RND 180
 12:GOSUB 3011
 20:L1=RND 180:R1=
    L1+35
 25:IF (L1<2)OR (R
    1>208)GOTO 20
 26:IF (L1>T)OR R1
    <TGOTO 20
 30:L2=RND 180:R2=
    L2+35
 35:IF (L2<2)OR (R
    2>208)GOTO 30
 36:IF L2>R1OR R2<
    L1GOTO 30
 40:L3=RND 180:R3=
    L3+35
 45:IF (L3<2)OR (R
    3>208)GOTO 40
 46:IF L3>R2OR R3<
    L2GOTO 40
 50:G1=RND 180:G2=
    G1+40
 55:IF G1>R3OR G2<
    L3GOTO 50
 90:TT=RND 30
 99:FOR Z=1TO 3
100:LINE (T,-TT)-(
    T+3,-TT+3),0,3
    ,B
101:NEXT Z
115:GOSUB 998:
    GOSUB 701+J2
118:COLOR 2
119:FOR ZZ=L1TO R1
    STEP 4
120:LINE (ZZ,10)-(
    ZZ,D1),6,2
121:NEXT ZZ
125:D2=D1+D2
129:FOR ZZ=L2TO R2
    STEP 4
130:LINE (ZZ,D1)-(
    ZZ,D2),4,2
131:NEXT ZZ
135:D3=D2+D3
139:FOR ZZ=L3TO R3
    STEP 4
140:LINE (ZZ,D2)-(
    ZZ,D3),2,2
141:NEXT ZZ
147:G3=D3+20+RND 2
    5:G4=40+G3
148:LINE (G1,G3)-(
    G2,G4),3,3,B
149:FOR ZZ=G3TO G4
    STEP 5
150:LINE (G1,ZZ)-(
    G2,ZZ),2,2
151:NEXT ZZ
160:H1=G1+RND 30:H
    2=G3+RND 30
164:FOR ZZ=1TO 5
165:LINE (H1,H2)-(
    H1+7,H2+7),0,3
    ,B
166:NEXT ZZ
168:GOSUB 5000
169:DX=G2+10:IF DX
    >160LET DX=0
170:DD=H2+TT:
    GLCURSOR (DX,H
    2)
171:LPRINT DD
190:GOSUB 800
200:GLCURSOR (T,-T
    T)
205:BEEP 2:WAIT 20
    0:PRINT "WIND=
    ";W
210:INPUT "ANGLE "
    ;X
212:IF X<0LET X=36
    0-ABS X
220:INPUT "FORCE "
    ;Y
225:IF Y>299LET Y=
    600-Y
230:S1=Y*SIN X
240:S2=Y*COS X
242:IF C=0GOTO 246
244:RLINE (0,0)-(0
    ,320),9
246:USING "########
    "
248:GOSUB 1000
249:USING
250:RLINE (0,0)-(S
    1,S2),0,B:C=C+
    1
251:FOR XX=1TO 7
253:RLINE (0,0)-(-
    1,-1),0,B,B
254:NEXT XX
256:RLINE (0,0)-(0
    ,-320),9
260:GOTO 210
500:"A":GLCURSOR (
    T,-TT):C=0
501:PL=PL+1:U=64:U
    2=35
502:GOSUB 1502
505:J=3:K=20
510:B=B+1:IF B>3
    LET B=0
515:GOSUB 3011
517:GOSUB 800
520:GOTO 210
700:D1=25+RND 110:
    D2=25+RND 110:
    D3=25+RND 110:
    RETURN
702:D1=40+RND 140:
    D2=40+RND 140:
    D3=30+RND 120:
    RETURN
800:GLCURSOR (G2,G
    4)
810:W1=25*SIN W
812:W2=25*COS W
815:RLINE (0,0)-(W
    1,W2),1,B
821:RLINE (0,0)-(0
    ,-30),9
840:GLCURSOR (T,-T
    T)
850:RETURN
998:J2=2*(RND 2)-3
    :RETURN
999:J1=(RND 3)-2:
    RETURN
1000:BB=10:GOSUB
    998:M=J2
1010:A$="0"
1015:TIME =0
1020:A=RND U:TM=
    TIME :TM=TM*
    1E4
1025:BB=BB+((RND
    3)-1)*M
1030:WAIT A
1040:A$=INKEY$
1045:AA=VAL A$
1046:AA=AA/2
1055:PRINT HP;W;"
    ";BB:U2=U
    2+1:IF U2>35
    LET U2=0:U=U
    /2
1060:IF AA>0BEEP
    1:GOSUB 2000
    :PRINT Y:
    GOTO 1080
1062:IF (ABS BB>K
    )LET M=-1
1063:IF ABS BB<J
    LET M=1
1064:J=J+RND 8:K=
    14+RND 11
1066:IF TM>HCBEEP
    7:GOTO 1015
1070:GOTO 1020
1080:RETURN
1502:HC=14:HP=0:
    INPUT "HANDI
    CAP=";HP:HC=
    HC+3*HP:IF H
    P>15LET HC=1
    59
1503:RETURN
2000:IF AA>0LET Y
    =Y-(Y*AA/10)
2005:IF A$="8"
    GOSUB 6020
2010:S1=Y*SIN X
2020:S2=Y*COS X
2040:S1=S1+(SIN W
    *BB*Y/100)
2060:S2=S2+(COS W
    *BB*Y/100)
2070:IF A$="9"LET
    S1=S1-10+RND
    19:S2=S2-10+
    RND 19
2080:RETURN
3011:WW=RND 360
3012:W=WW+180
3013:IF W>360LET
    W=W-360
3014:BEEP 2:WAIT
    100:PRINT "W
    IND=";W;" :
    HANDICAP=";H
    P:WAIT
3024:RETURN
5000:CL=(RND 10)-
    1:IF CL>7
    GOTO 5030
5001:IF CL>3LET C
    L=3
5009:FOR BU=0TO 9
    STEP 3
5010:LINE (G1-BU,
    G3-BU)-(G2+B
    U,G4+BU),1,C
    L,B
5020:NEXT BU
5030:GOTO 5100
5100:U1=0:U2=G1+1
    5:U3=G4+20-
    RND 11:U4=G4
    +50
5105:IF U2>100LET
    U1=RND 80
5120:CL=(RND 6)-1
    :IF CL>3GOTO
    5150
5140:GOSUB 5900
5150:U1=G2-15:U2=
    215:U3=G4+20
    -RND 11
5155:IF U1<100LET
    U2=U2-RND 80
5160:CL=(RND 6)-1
    :IF CL>3GOTO
    5200
5170:GOSUB 5900
5200:U1=0:U2=G1-2
    0+RND 11:U3=
    G3-RND 9:U4=
    G4+RND 9
5205:IF U2>80LET
    U1=RND 60
5210:CL=(RND 6)-1
    :IF CL>3GOTO
    5250
5230:GOSUB 5900
5250:U1=G2+20:U2=
    215:U3=G3-
    RND 9:U4=G4-
    5+RND 14
5255:IF U1<140LET
    U2=U2-RND 65
5260:CL=(RND 6)-1
    :IF CL>3GOTO
    5300
5270:GOSUB 5900
5300:U1=0:U2=G1+1
    5:U3=D3+5:U4
    =G3-12
5310:CL=(RND 6)-1
    :IF CL>3GOTO
    5350
5340:GOSUB 5900
5350:U1=G2-15:U2=
    215:U4=G3-12
5360:CL=(RND 6)-1
    :IF CL>3GOTO
    5400
5370:GOSUB 5900
5400:U1=(D3-D2)*6
    0:U2=(D3-D2
    (60)
5410:U1=RND (.5*L
    3):U2=L3-RND
    15:U3=(D3-60
    )*U1+D2*U2:U
    4=D3
5420:CL=(RND 5)-1
    :IF CL>3GOTO
    5450
5430:GOSUB 5900
5450:U1=R3+RND 15
    :U2=215-RND
    ((215-R3)/2)
5460:CL=(RND 6)-1
    :IF CL>3GOTO
    5500
5470:GOSUB 5900
5500:RETURN
5900:IF U2-U1<=U4
    -U3LET CE=(U
    2-U1)/2:GOTO
    5930
5910:CE=(U4-U3)/2
5930:FOR F=0TO (C
    E-2)STEP 3
5932:IF CL=1LET C
    N=0:GOTO 594
    0
5935:CN=RND 8
5940:LINE (U1+F,U
    3+F)-(U2-F,U
    4-F),CN,CL,B
5950:NEXT F
5960:RETURN
6020:Z=RND 3
6030:IF Z=1LET X=
    RND 360
6040:IF Z=2LET Y=
    RND (2*Y)
6050:RETURN
```

```
STATUS 1
                    3193
```



"PROCESSION"

by John M.Kerr

```
1Ø: REM RTLCD DEMONSTRATION
2Ø: POKE &7752,&48,&76,&4A,&4C,&58,&77,&5A,&51,&68,&77,&6A,&4C,&45,&53
3Ø: POKE &776Ø,&65,&53,&Ø5,&53,&67,&53,&62,&FD,&62,&25,&43,&FD,&6Ø,&25
4Ø: POKE &776E,&53,&88,&ØA,&6A,&4E,&8E,&77,&76,&65,&F1,&43,&65,&53,&9A
5Ø: A$="7F5C1C1C7F4EØCØC": B$="183Ø7Ø787E3EØCØC": C$="4C2E1F181B1F2E4C"
6Ø: WAIT Ø: FOR N=1 TO 13: GPRINT @$(RND 3),Ø,Ø;: NEXT N
7Ø: IF INKEY$="" GOTO 7Ø
8Ø: CALL &7752: BEEP 1,5Ø+RND 5Ø,2Ø: GOTO 7Ø
9Ø: REM PRESS ANY KEY WHEN THE DISPLAY APPEARS
```

PC-1500 LCD ROTATE RIGHT.

addr	opcode	label	instruction		comment
7752	48 76	RTLCD	LDI	XH,&76	; Set up pointers
7754	4A 4C		LDI	XL,&4C	; to display area
7756	58 77		LDI	YH,&77	;
7758	5A 51		LDI	YL,&51	;
775A	68 77		LDI	UH,&77	;
775C	6A 4C		LDI	UL,&4C	;
775E	45		LIN	X	; Use addresses
775F	53		SDE	Y	; 774E to 7751
7760	65		LIN	U	; as temporary
7761	53		SDE	Y	; stores, for the
7762	05		LDA	(X)	; last two bytes
7763	53		SDE	Y	; in each half
7764	67		LDE	U	; of the display
7765	53		SDE	Y	;
7766	62		DEC	UL	;
7767	FD 62	AGAIN	DEC	UH	; Block transfer
7769	25		LDA	(U)	; of display bytes
776A	43		SDE	X	; in sections 1-3
776B	FD 60		INC	UH	; and 2-4
776D	25		LDA	(U)	; (76 byte pairs)
776E	53		SDE	Y	;
776F	88 0A		LOP	AGAIN	;
7771	6A 4E		LDI	UL,&4E	; Point to saved
7773	BE 77 76		SJP	EXTRA	; bytes & move
7776	65	EXTRA	LIN	U	; them into place
7777	F1		AEX		; Two of these must
7778	43		SDE	X	; have hex digits
7779	65		LIN	U	; exchanged, to
777A	53		SDE	Y	; move into other
777B	9A		RTN		; half of display

Length: 42 bytes.
Timing: 4221 cycles, or approx. 3¼ milliseconds @ 1·3MHz.
As it stands, this routine is not relocatable, and must be executed from address &7752. The four bytes preceding this address are used as working space by the program.
RTLCD occupies the RAM area normally reserved for fixed memories P$, Q$ and R$.

[This program is worth serious study by anyone trying to learn about machine-code. However the demonstration program at the top of the page works whether you understand it or not, and will amuse children who are very young. Press any key to execute the program]

ELKAN ELECTRONICS

PRESENTS...
A REVOLUTIONARY NEW
PROGRAM FOR THE SHARP
PC-1500 POCKET COMPUTER...

e1 EASI-ONE!

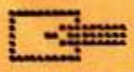
WHAT IS EASI-ONE!

Six programs rolled into ONE! Always in your machine and always available to solve hundreds of problems without the effort of having to load from tape each time! EASI-ONE! incorporates a calendar/alarm clock, an electronic notepad, a unit conversion facility, a simple, but powerful text editor, statistics and forecasting facilities - and an electronic spreadsheet calculator.

Each of the program 'modules' is selected by a single key-press from a graphics-display menu - and each can be cleared when you have finished with it. AND YOU CAN HAVE ALL SIX MODULES SET UP IN YOUR MACHINE AT THE SAME TIME!!

ALARM

Combined with an easy-to-read clock & calendar (automatically displayed on power-up), the ALARM can be set for up to 99 diferent times. At the set times, the alarm will sound and a message (pre-set by you) will be displayed.

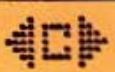


NOTEPAD

Used as a casual scratch pad or an address/telephone index, the NOTEPAD can hold up to 99 lines of 23 characters - about 400 words. NOTEPAD is equipped with a 'Find' facility to locate entries rapidly.

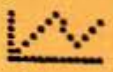
TEXT

A handy text editor with line insert/delete facilities, word carry-over to next line, selective printing of all or part of document and other easy-to-use facilities. TEXT can handle 80 lines of 36 characters (99 with the CE-161 16K module) - nearly 500 words. Can link in with NOTEPAD to transfer NOTEPAD lines to TEXT (names, addresses etc.) Ideal for memos, informal letters etc., using the CE-150 printer.



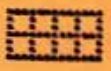
CONVERT

A handy unit conversion facility always at your fingertips. Miles to kilometres, dollars to yen - enter your own choices (up to 99 of them) and CONVERT will always be there for instant use.



STATS

Rapidly calculates total, average & standard deviation for each of two columns of data that you enter. Using linear regression techniques, STATS can also attempt to find a relationship between the two sets of data (with linear, exponential or root relationships) which can then be used for forecasting.



CALC

An electronic spreadsheet calculator - ideal for solving the 'what-if' type of problem. Up to 110 cells available (over 400 with the 16K module). Can accept complex formulae up to 16 characters long (e.g. B5*(A5-A2*12)). Can handle Boolean logic equations. Uses machine code routines for speed. Data from either rows or columns can be moved over to STATS for analysis.

Other features in each module include:- 'browse' facility, hard-copy printout, rapid movement to beginning or end of module & numeric rounding of displayed figures.

What equipment does EASI-ONE! need?

- Sharp PC-1500 or Tandy PC-2 Pocket computer.
- Either 8K or 16K RAM module.
- CE-150 Printer/Cassette interface.
- Compatible cassette recorder.

Designed for Pocket Computers!

EASI-ONE! is no look-alike program adapted from other micros. It is specifically designed for the pocket computer with its ability to retain programs and data. For the big applications, you'll want to use the other programs in the EASI-range - EASI-CALC, EASI-TREND, EASI-FILE and EASI-CASH. But for all those day-to-day applications, EASI-ONE! is the ONE!.

WHAT'S IN THE EASI-ONE! PACKAGE?

EASI-ONE! comes to you in the form of a data-quality program tape and a 50-page user's manual with a rapid reference section. EASI-ONE! costs £24.95 (incl. VAT) and is available from your local dealer or direct from the sole UK distributors:

Elkan Electronics, FREEPOST (no stamp required),
11 Bury New Road, Prestwich, Manchester M25 6LZ
Telephone 061-798 7613 (24-hour service)